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| 09/963,588 | 09/27/2001 | Yoshinori Takeuchi | PADE :063 | 9684 |

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EXAMINER

CONNELLY CUSHWA, MICHELLE R

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2874

DATE MAILED: 06/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/963,588

Applicant(s)

TAKEUCHI ET AL.

Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-15 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-14, drawn to an optical wavelength filter, classified in class 385, subclass 37.
- II. Claim 15, drawn to a method of manufacturing an optical wavelength bandpass filter, classified in class 385, subclass 37.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another materially different process, for example, the grating could be etched into the waveguide.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Robert Wieland on June 12, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-14. Affirmation of this election must be made by applicant in replying to this

Office action. Claim 15 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

Eleven (11) sheets of formal drawings were filed on September 27, 2001 and have been accepted by the Examiner.

Specification

The disclosure is objected to because of the following informalities:

On page 16, line 15, "phase mask 14" should be -phase mask 13--.

Appropriate correction is required.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by

Harumoto et al. (US 6,021,242).

Regarding claims 1-4; Harumoto et al. discloses an optical band-pass filter (7) in Figure 1, the filter comprising:

- an optical fiber waveguide, having a core (1) and a cladding (2); and
- a structure (4) of periodically varying diffraction coefficient formed in the core (1) and extending along a direction of propagation of light through the filter (7);
- wherein at least one parameter of the periodically varying diffraction coefficient structure (4) continuously varies along the direction of propagation such as to create a range of reflection wavelengths of the filter, that parameter being the pitch (see column 5, line 45, through column 6, line 44);
- wherein the periodically varying diffraction coefficient structure comprises at least one interruption portion (zero area, 3) in which interruption of the continuous variation occurs, thereby creating a

- corresponding passband of the filter, with the passband located at a predetermined position within the range of reflection wavelengths;
- wherein the at least one interruption portion (3) comprises a portion of the periodically varying diffraction coefficient structure at which a transition occurs from a first value of the pitch to a second value of the pitch;
 - wherein the interruption portion (3) comprises an interruption region of predetermined length extending along the direction of propagation and located at a predetermined position along the periodically varying diffraction coefficient structure (4); and
 - wherein the interruption portion (3) comprises a discontinuity of the continuous variation of the pitch, the discontinuity being located at a predetermined position along the periodically varying diffraction coefficient structure (4).

Regarding claims 8 and 9; the average value of the diffraction coefficient of the periodically varying diffraction coefficient structure (4) continuously varies through the diffraction coefficient structure (4). Therefore, the parameter that continuously varies is a combination of a continuously varying average value of diffraction coefficient and a continuously varying pitch; wherein the interruption portion (3) of the periodically varying diffraction coefficient structure (4) comprises a discontinuity located at a predetermined position along the periodically varying diffraction coefficient structure (4), with a transition from a first average value of diffraction coefficient to a second average value

of diffraction coefficient and also a transition from a first value of the pitch to a second value of the pitch, respectively, occurring at the discontinuity, the interruption portion (3) having a predetermined length.

Claims 1 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Bakhti et al. (US 5,887,094).

Regarding claims 1 and 5-7; Bakhti et al. discloses an optical wavelength band-pass filter in Figures 3, the filter comprising:

- an optical fiber or an optical waveguide (see column 1, lines 5-10), wherein both optical fibers and optical waveguides must inherently have a core and a cladding in order for an optical signal to be guided therein;
- a structure (BG2) of periodically varying diffraction coefficient extending along a direction of propagation of light through the filter and with at least one parameter of the periodically varying diffraction coefficient structure (BG2) continuously varying along the direction of propagation such as to create a range of reflection wavelengths of the filter;
- wherein the periodically varying diffraction coefficient structure (BG2) comprises at least one interruption portion (PS2, PS3) in which interruption of the continuous variation occurs, for thereby causing a corresponding passband of the filter, with the passband located at a predetermined position within the range of reflection wavelengths;

- wherein the periodically varying diffraction coefficient structure has a fixed pitch;
- wherein the parameter that continuously varies is an average value of diffraction coefficient of the periodically varying diffraction coefficient structure (BG2);
- wherein the at least one interruption portion (PS2, PS3) comprises a portion of the periodically varying diffraction coefficient structure at which a transition occurs from a first average value of diffraction coefficient to a second average value of diffraction coefficient;
- wherein each interruption portion (PS2, PS3) comprises a discontinuity in the continuous variation of diffraction coefficient, the discontinuity being located at a predetermined position and being of predetermined length.

Claims 1-4, 8 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Xie et al. (US 2001/0048788 A1).

Regarding claims 1-4, 8 and 9; Figure 5 of Xie et al. discloses an optical waveguide filter (501) for use in an optical device, the filter comprising:

- a fiber Bragg grating, wherein the fiber is an optical waveguide that inherently has a core and a cladding in order for light to be guided by the fiber;

- a structure (chirped Bragg grating) of periodically varying diffraction coefficient extending along a direction of propagation of light through the filter (501);
- wherein at least one parameter (the average value of diffraction coefficient and the pitch) continuously varies along the direction of propagation such as to create a range of reflection wavelengths of the filter;
- wherein the Bragg grating comprises two interruption portions (see Figure 5) in which interruption of the continuous variation of the parameter occurs, thereby creating a corresponding pass-band of the filter (501), the pass-band located at a predetermined position within the range of reflection wavelengths;
- wherein the interruption portions are of a predetermined length and located at a predetermined position;
- wherein the interruption portion includes a discontinuity and the continuously varying parameter is interrupted at the discontinuity;
- wherein a transition from a first value to a second value of the pitch occurs at the interruption portions; and
- wherein a transition from a first average value of diffraction coefficient to a second average value of diffraction coefficient occurs at the interruption portions.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xie et al. (US 2001/0048788 A1) in view of Feng et al. (US 5,982,963).

Regarding claims 10, 13 and 14; Xie et al. discloses all of the limitations of claims 10, 13 and 14 as applied to claim 1 above, except for specifically stating that the periodically varying diffraction coefficient structure is formed by selective application of heat, mechanical stress, or electrical fields. Xie et al., however, does state that the teachings of the disclosure are based on the Bragg gratings disclosed by Feng et al.

Thus, one of ordinary skill in the art at the time of the invention would have recognized that the teachings of Feng et al. with respect to Bragg gratings could be incorporated in the invention of Xie et al.

In column 2, line 40, through column 3, line 60, Feng et al. teaches that the effective index of refraction (hence, the effective diffraction coefficient) of the optical perturbation (the grating) changes in response to selective application of heat from a temperature field; mechanical stress from a piezoelectric element; or an electric field.

Therefore, one of ordinary skill in the art would have found it obvious to selectively apply heat, mechanical stress, and/or electrical fields to form a desired configuration of the grating disclosed by Xie et al.

Regarding claims 11 and 12; selective application of heat inherently requires a heat application control means. Additionally, heater elements disposed upon sections of optical waveguides are commonly used in the art to adjust and/or control the temperature of the waveguides. Therefore, one of ordinary skill in the art would have found it obvious to selectively apply heat to the gratings using heater elements disposed upon the section of the waveguides containing the grating in the invention of Xie et al.

Conclusion

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (703) 305-5327. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956 or to the technical support staff supervisor at telephone number (703) 308-3072.

- Application/Control Number: 09/963,588
Art Unit: 2874

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Michelle R. Connelly-Cushwa

MRCC

June 12, 2003

Akmal

AKM ENAYET ULLAH
PRIMARY EXAMINER